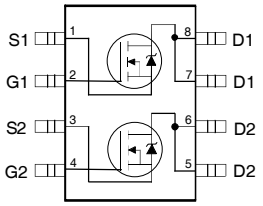
Description

The SOP-8 has been modified through a customized leadframe for enhanced thermal characteristics and multiple-die capability making it ideal in a variety of power applications. With these improvements, multiple devices can be used in an application with dramatically reduced board space. The package is designed for vapor phase, infra red, or wave soldering techniques. Power dissipation of greater than 0.8W is possible in a typical PCB mount application.



SOP-8

- Generation V Technology
- Ultra Low On-Resistance
- Dual N-Channel Mosfet
- Surface Mount
- Dynamic dv/dt Rating
- Fast Switching
- Lead-Free

Features

- $V_{DS\ (V)}$ = 55V
- I_D= 4.7A (V_{GS}=10V)
- $R_{DS(ON)}$ < 30mΩ (V_{GS} = 10V)
- $R_{DS(ON)}$ < 45mΩ (V_{GS} = 4.5V)

Absolute Maximum Ratings

	Parameter	Max.	Units
V_{DS}	Drain- Source Voltage	55	V
I_D @ T_C = 25°C	Continuous Drain Current, V_{GS} @ 10V	4.7	A
I_D @ T_C = 70°C	Continuous Drain Current, V_{GS} @ 10V	3.8	
I_{DM}	Pulsed Drain Current ①	38	
P_D @T_C = 25°C	Power Dissipation	2.0	W
P_D @T_C = 70°C	Power Dissipation	1.3	
	Linear Derating Factor	0.016	W/°C
V_{GS}	Gate-to-Source Voltage	± 20	V
V_{GSM}	Gate-to-Source Voltage Single Pulse tp<10μs	30	V
E_{AS}	Single Pulse Avalanche Energy②	72	
dv/dt	Peak Diode Recovery dv/dt ③	5.0	V/ns
T_J, T_{STG}	Junction and Storage Temperature Range	-55 to + 150	°C

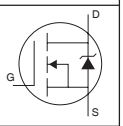
Thermal Resistance

	Parameter	Typ.	Max.	Units
$R_{\theta JA}$	Maximum Junction-to-Ambient⑤		62.5	°C/W

Electrical Characteristics @ T_J = 25°C (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	55			V	V_{GS} = 0V, I_D = 250μA
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient		0.059		V/°C	Reference to 25°C, I_D = 1mA
$R_{DS(on)}$	Static Drain-to-Source On-Resistance			30	mΩ	V_{GS} = 10V, I_D = 4.7A ④
				45		V_{GS} = 4.5V, I_D = 3.8A ④
$V_{GS(th)}$	Gate Threshold Voltage	1.0			V	V_{DS} = V_{GS}, I_D = 250μA
g_{fs}	Forward Transconductance	7.9			S	V_{DS} = 10V, I_D = 4.5A
I_{DSS}	Drain-to-Source Leakage Current			2.0	μA	V_{DS} = 55V, V_{GS} = 0V
				25		V_{DS} = 55V, V_{GS} = 0V, T_J = 55°C
I_{GSS}	Gate-to-Source Forward Leakage			-100	nA	V_{GS} = -20V
	Gate-to-Source Reverse Leakage			100		V_{GS} = 20V
Q_g	Total Gate Charge		24	36	nC	I_D = 4.5A
Q_{gs}	Gate-to-Source Charge		2.3	3.4		V_{DS} = 44V
Q_{gd}	Gate-to-Drain ("Miller") Charge		7.0	10		V_{GS} = 10V, See Fig. 10 ④
$t_{d(on)}$	Turn-On Delay Time		8.3	12	ns	V_{DD} = 28V
t_r	Rise Time		3.2	4.8		I_D = 1.0A
$t_{d(off)}$	Turn-Off Delay Time		32	48		R_G = 6.0Ω
t_f	Fall Time		13	20		R_D = 16Ω, ④
C_{iss}	Input Capacitance		740		pF	V_{GS} = 0V
C_{oss}	Output Capacitance		190			V_{DS} = 25V
C_{rss}	Reverse Transfer Capacitance		71			ƒ = 1.0MHz, See Fig. 9

Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)			2.0	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode) ①			38		
V_{SD}	Diode Forward Voltage			1.2	V	T_J = 25°C, I_S = 2.0A, V_{GS} = 0V ③
t_{rr}	Reverse Recovery Time		60	90	ns	T_J = 25°C, I_F = 2.0A
Q_{rr}	Reverse RecoveryCharge		120	170	nC	di/dt = -100A/μs ③

Notes:

① Repetitive rating; pulse width limited by max. junction temperature. (See fig. 11)

② Starting T_J = 25°C, L = 6.5mH R_G = 25Ω, I_{AS} = 4.7A. (See Figure 8)

③ I_{SD} ≤ 4.7A, di/dt ≤ 220A/μs, V_{DD} ≤ $V_{(BR)DSS}$, T_J ≤ 150°C

④ Pulse width ≤ 300μs; duty cycle ≤ 2%.

⑤ When mounted on 1 inch square copper board, t<10 sec

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

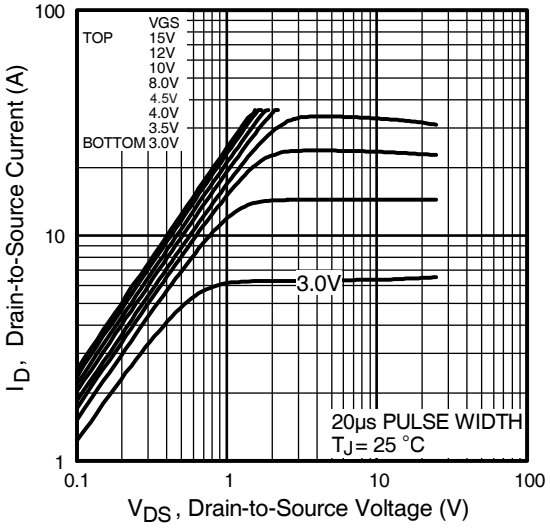


Fig 1. Typical Output Characteristics

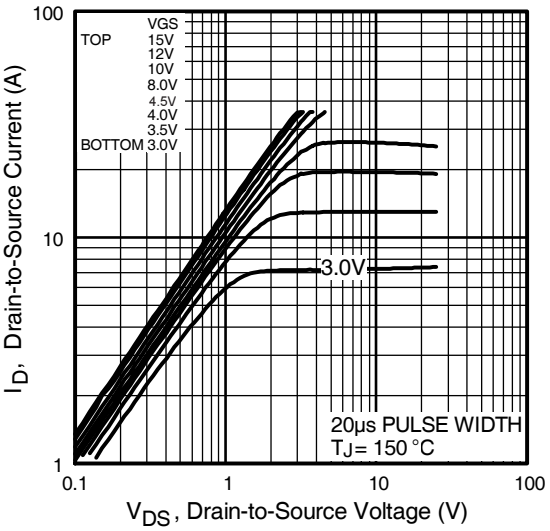


Fig 2. Typical Output Characteristics

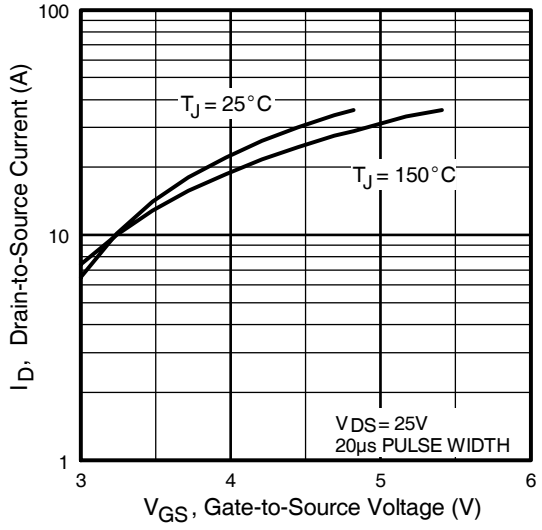


Fig 3. Typical Transfer Characteristics

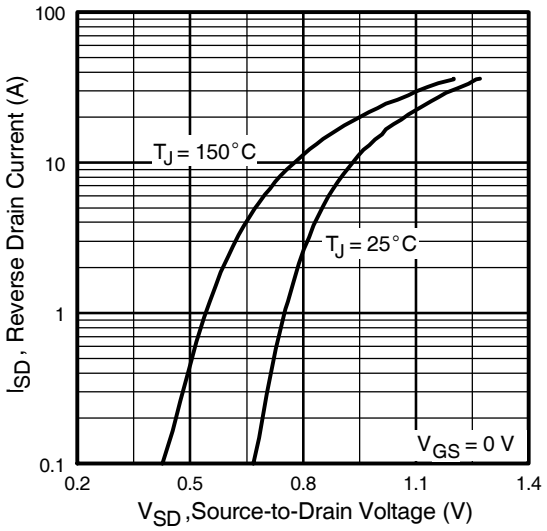


Fig 4. Typical Source-Drain Diode Forward Voltage

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

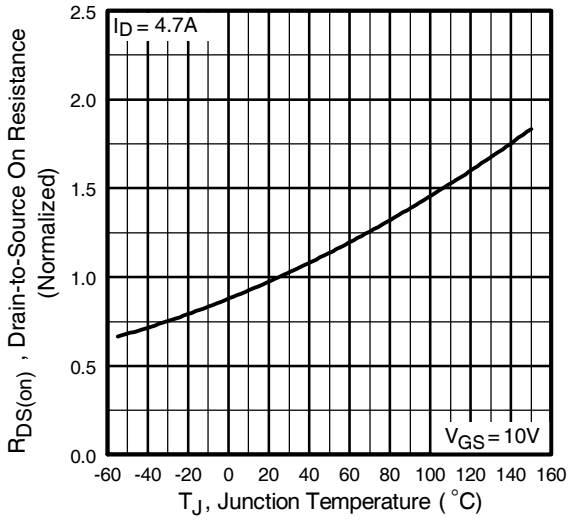


Fig 5. Normalized On-Resistance Vs. Temperature

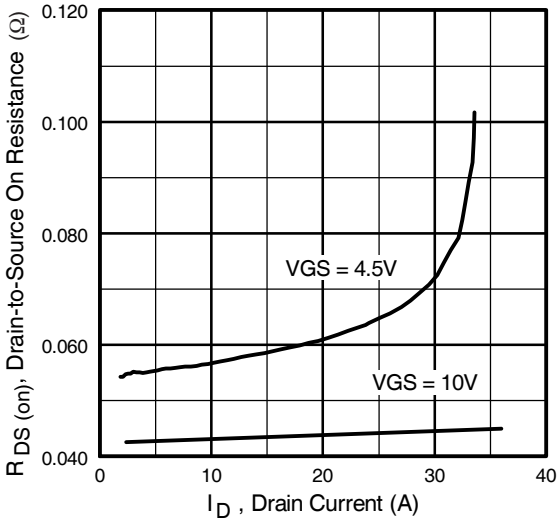


Fig 6. Typical On-Resistance Vs. Drain Current

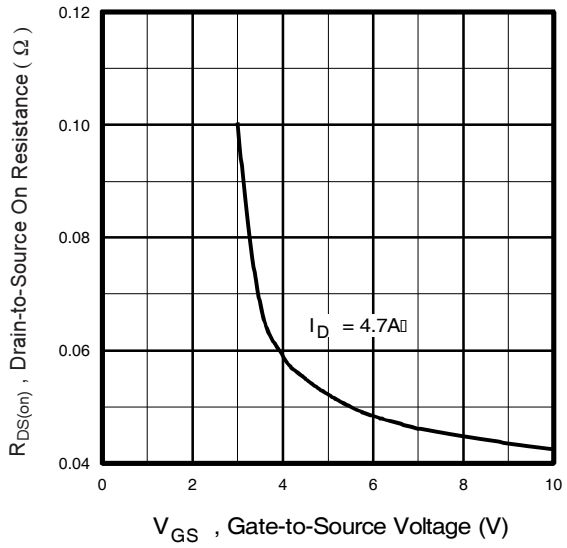


Fig 7. Typical On-Resistance Vs. Gate Voltage

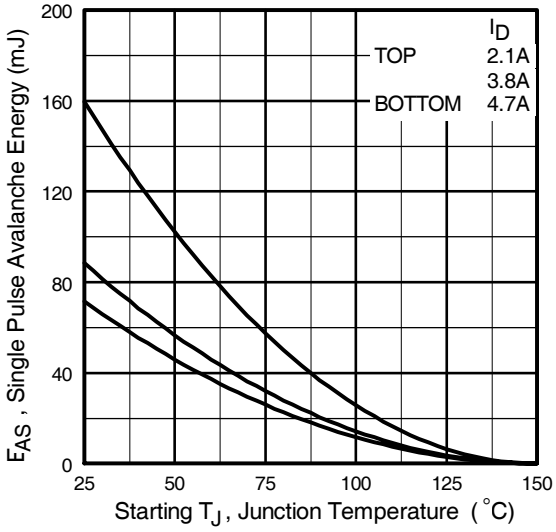


Fig 8. Maximum Avalanche Energy Vs. Drain Current

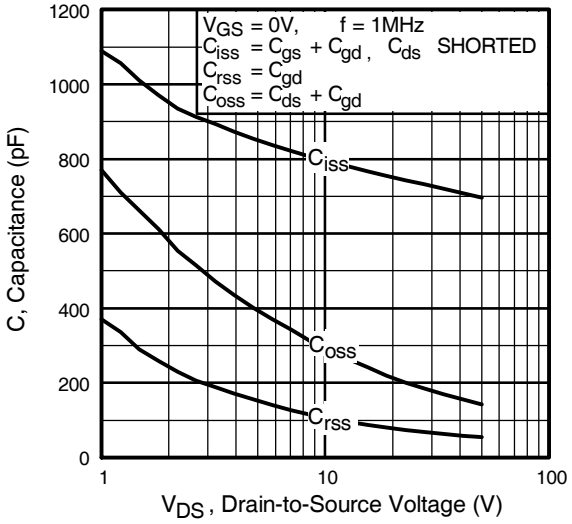


Fig 9. Typical Capacitance Vs. Drain-to-Source Voltage

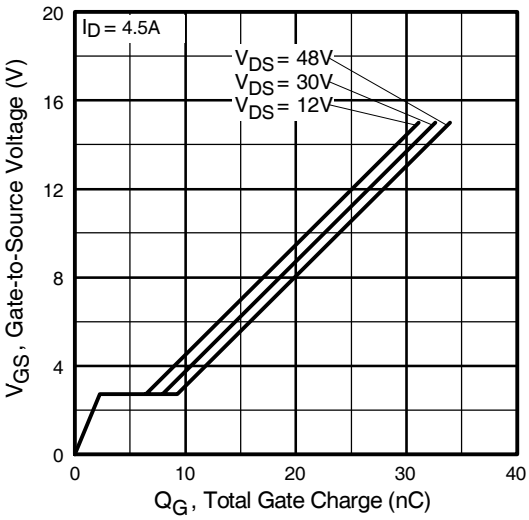


Fig 10. Typical Gate Charge Vs. Gate-to-Source Voltage

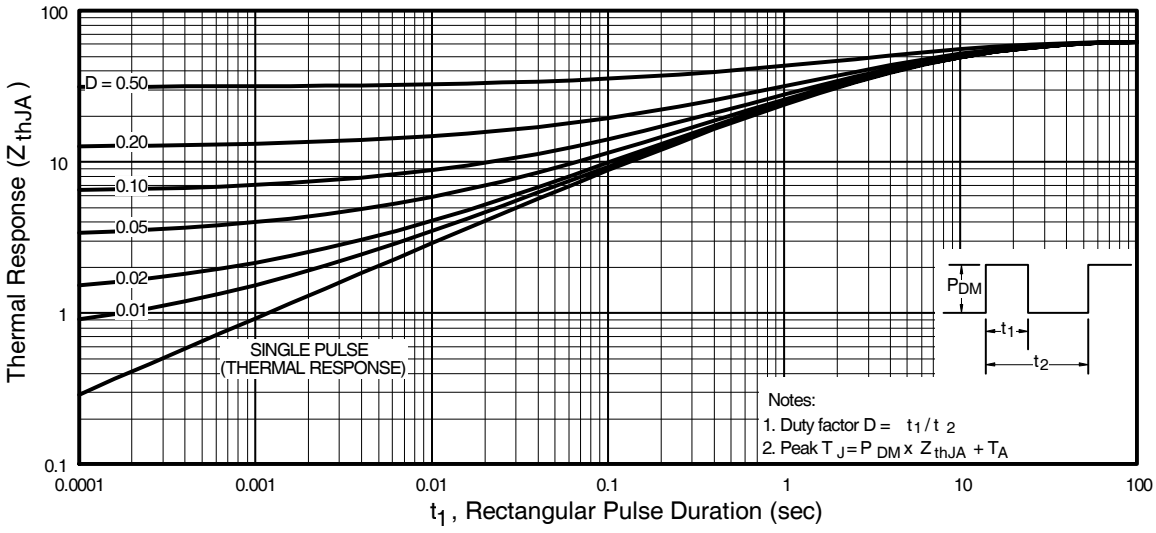
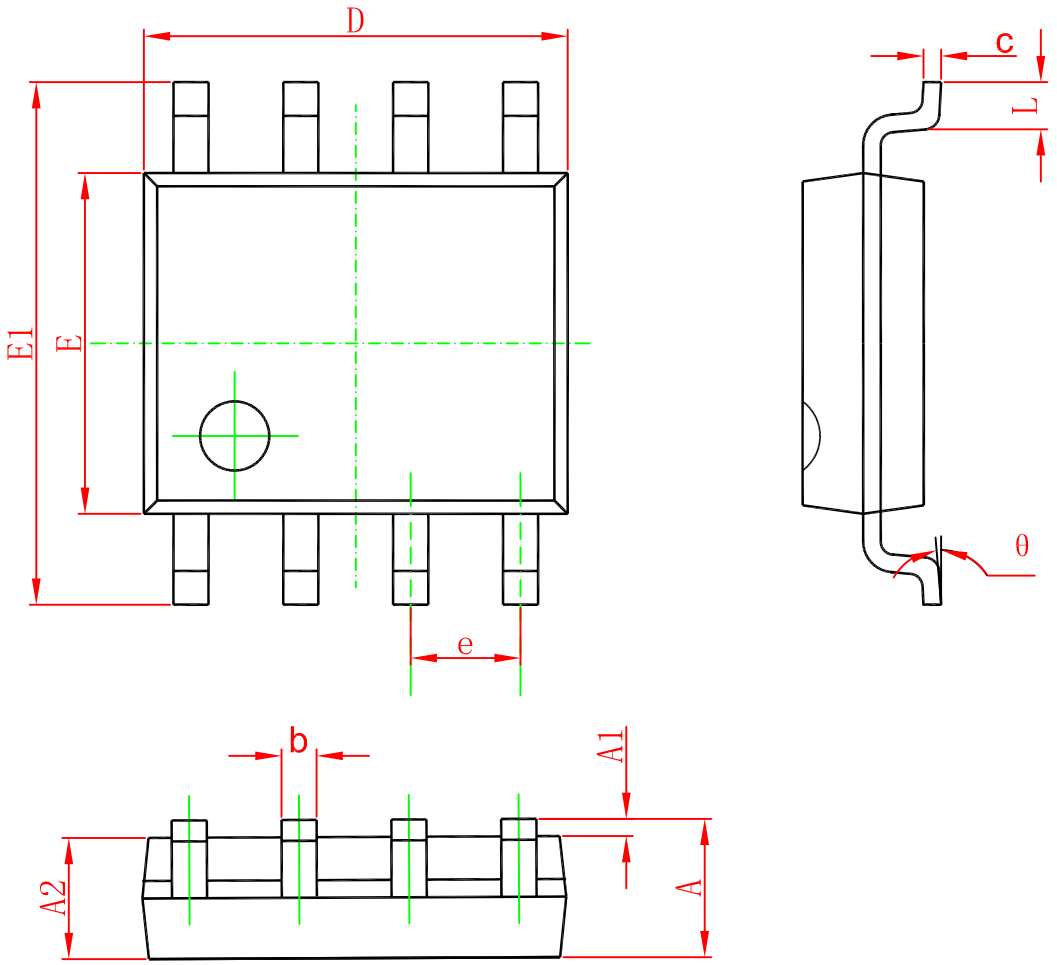


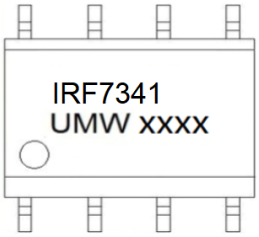
Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

SOP-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

Marking



Ordering information

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UMW IRF7341TR	SOP-8	3000	Tape and reel

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